PATENT

In the United States Patent and Trademark Office

Applicant: Rosenberg et al.
Applicant's Ref: IMM1P030B
Application No: Unassigned
Filed: 11/13/01
Title: Force Feedback Applications Based on Cursor Engagment with Graphical Targets

Examiner: Unassigned
Group Art Unit: Unassigned

PRELIMINARY AMENDMENT A

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Please amend the above identified patent application as follows before the examination of the application:

In the Title:

Please delete the title and replace with: -- Force Feedback Applications Based on Cursor Engagment with Graphical Targets --.

CLEAN VERSION OF AMENDMENTS

In the Specification:

Replace the paragraph starting on page 1, line 9, with:

This application is a continuation of copending U.S. Patent Application No. 09/590,856, filed June 8, 2000, which is a continuation of Application No. 08/879,296, filed June 18, 1997, which is a continuation-in-part of patent applications no. 08/571,606, filed December 13 1995, and no. 08/756,745, filed November 26 1996, assigned to the assignee of this present application, and all of which are incorporated by reference herein in their entireties.

In the Claims:

All pending claims are reproduced below for the convenience of the Examiner. Claims that have been changed by this amendment are marked as "amended." No marked up version of the claims is presented since all of the claims are new.

Please cancel claims 1-43 without prejudice.

Please add the following claims:

44. (new) A method for interfacing an interface device with a host computer to select a function in a graphical user interface implemented on said host computer, the host computer in communication with the interface device, the method comprising:

causing an update of a display of a cursor within said graphical user interface using sensor information received from said interface device, said sensor information representing motion of at least a portion of said interface device;

enabling a determination of whether said cursor engages a graphical target displayed within said graphical user interface;

enabling a determination of a speed of said engagement of said cursor with said graphical target; and

causing a tactile feedback command to be provided, based upon said speed of said engagement, to said interface device to cause a tactile sensation to be output to a user when said cursor engages said graphical target.

45. (new) A method as recited in claim 44 wherein if said speed of engagement is above a predetermined threshold speed, a tactile sensation is not output to said user, and if said speed of engagement is below said predetermined threshold speed, a tactile sensation will be output to said user.

46. (new) A method as recited in claim 45 wherein different threshold speeds are associated with different tactile sensations.

47. (new) A method as recited in claim 44 further comprising determining when said cursor has moved to or past a trigger location positioned in said graphical target.

48. (new) A method as recited in claim 47 further comrprising selecting a function within said graphical user interface when said cursor has moved to or past said trigger location.

49. (new) A method as recited in claim 48 wherein said selecting only is performed when said engagement speed is below a predetermined threshold speed.

50. (new) A method as recited in claim 44 wherein said graphical target is a menu element displayed in said graphical environment.

51. (new) A method as recited in claim 44 wherein said graphical target is a graphical button.

52. (new) A method as recited in claim 44 further comprising changing at least one displayed characteristic of said graphical target to indicate that said function has been selected.

53. (new) A method as recited in claim 44 wherein said at least a portion of said interface device comprises a user object.

54. (new) A method as recited in claim 53 wherein said tactile sensation output to said user includes a force on said user object.

55. (new) A method as recited in claim 44 wherein the tactile sensation output to said user comprises one or more of a vibration, a texture, and a jolt.

56. (new) A method for interfacing an interface device with a host computer to select a function in a graphical user interface implemented on said host computer, the host computer in communication with the interface device, the method comprising:

causing an update of a display of a cursor within said graphical user interface using sensor information received from said interface device, said sensor information representing motion of at least a portion of said interface device;

enabling a determination of whether said cursor engages a graphical target displayed within said graphical user interface;

causing a tactile feedback command to be provided to said interface device to cause a tactile sensation to be output to a user when said cursor engages said graphical target;

enabling a determination of whether said cursor has moved to or past a trigger location positioned in said graphical target;

when said cursor has moved to or past said trigger location, enabling said selecting of said function within said graphical user interface; and

causing said tactile sensation to change indicate to said user that said function has been selected.

57. (new) A method as recited in claim 56 wherein said cursor is determined to have moved to said trigger position when said cursor has moved a distance past a point of engagement corresponding to a predetermined distance.

58. (new) A method as recited in claim 56 wherein said graphical target is modified visually when said cursor reaches said trigger position.

59. (new) A method as recited in claim 56 wherein said graphical target is a static selection surface and said cursor is maintained displayed at said original position of engagement while said at least a portion of said interface device moves in a direction corresponding to a direction into said graphical target.

60. (new) A method as recited in claim 56 wherein said graphical target is a menu element displayed in said graphical environment.

61. (new) A method as recited in claim 56 wherein said graphical target is a graphical button displayed in a web page graphical environment.

62. (new) A method as recited in claim 56 further comprising changing at least one displayed characteristic of said graphical target after said trigger location has been exceeded to indicate to said user that said function has been selected.

63. (new) A method as recited in claim 56 wherein said at least a portion of said interface device comprises a user object.

64. (new) A method as recited in claim 63 wherein said tactile sensation output to said user comprises a force on said user object.

65. (new) A method as recited in claim 56 wherein the tactile sensation output to said user comprises one or more of a vibration, a texture, and a jolt.

66. (new) A computer readable medium including program instructions for interfacing an interface device with a host computer and causing a function in a graphical user interface implemented on said host computer to be selected, the host computer in communication with the interface device, the program instructions performing steps comprising:

causing an update of a display of a cursor within said graphical user interface using sensor information received from said interface device, said sensor information representing motion of at least a portion of said interface device;

enabling a determination of whether said cursor engages a graphical target displayed within said graphical user interface;

causing a tactile feedback command to be provided to said interface device to cause a tactile sensation to be output to a user when said cursor engages said graphical target;

enabling a determination of whether said cursor has moved to or past a trigger location positioned in said graphical target;

when said cursor has moved to or past said trigger location, enabling said selecting of said function within said graphical user interface; and

causing said tactile sensation to change indicate to said user that said function has been selected.

REMARKS

Claims 44-66 are pending in this application. Claims 1-43 have been cancelled, and claims 44-66 have been added by this Amendment. Applicant has amended the specification and title as set forth above.

In view of the foregoing, Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,

James R. Riegel
Reg. 36,651

San Jose, California
408-467-1900

MARKED-UP VERSION OF AMENDMENTS

In the Specification:

Replace the paragraph starting on page 1, line 9, with:

This application is a continuation of copending U.S. Patent Application No. 09/590,856, filed June 8, 2000, which is a continuation of Application No. 08/879,296, filed June 18, 1997, which is a continuation-in-part of [co-pending parent] patent applications [serial] no. 08/571,606, filed December 13 1995, [on behalf of Rosenberg et al., entitled "Method and Apparatus for Providing Force Feedback for a Graphical User Interface",] and [serial] no. 08/756,745, filed November 26 1996, [on behalf of Rosenberg et al., entitled, "Force Feedback Interface having Isotonic and Isometric Functionality,"] assigned to the assignee of this present application, and [both] all of which are incorporated by reference herein in their entireties.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of L. Rosenberg et al. Application No. Unassigned Filed: 11/13/01 For: Force Feedback Applications Based on Cursor Engagement with Graphical Targets	Atty Docket No.: IMM030B Examiner: P. Bell Art Unit: 2675

SEPARATE LETTER TO THE OFFICIAL DRAFTSMAN

Commissioner for Patents
Washington, D.C. 20231

Sir:

Enclosed herewith are seven (7) sheets of formal drawings for the above-referenced case. If the draftsman has any questions concerning these drawings, please contact the undersigned at the number set forth below. If any fees are due in connection with the filing of these drawings, please charge such fees to deposit account 50-1815 (Order No. IMM030B).

Respectfully submitted,

James R. Riegel
Reg. No. **36,651**

801 Fox Lane
San Jose, CA 95131
(408) 467-1900

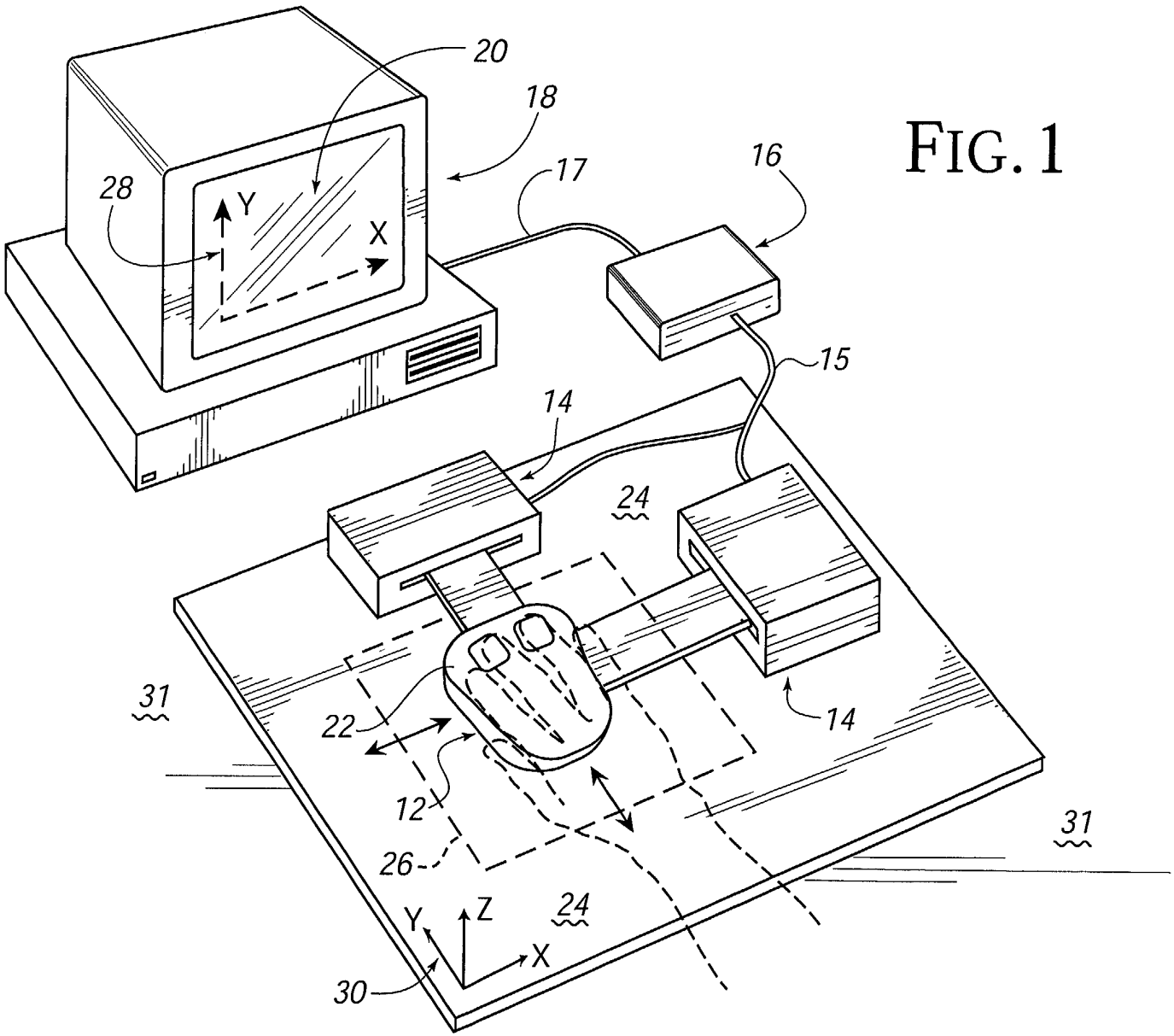


FIG. 1

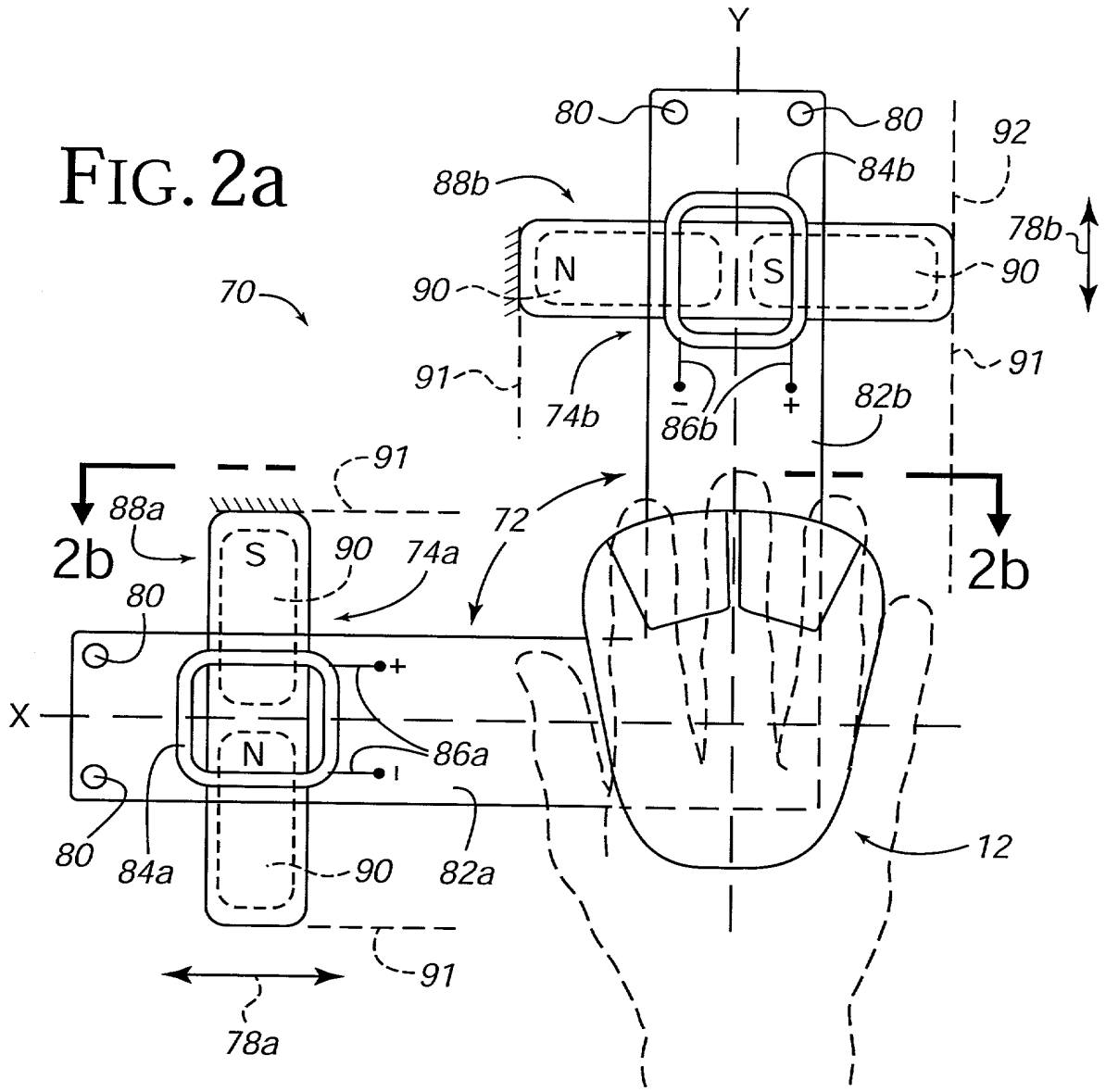

Y
80
80
92
88b
84b
78b
N
S
90
90
70
91
91
74b
86b
82b
91
72
88a
2b
2b
S
90
74a
80
X
N
86a
80
84a
90
82a
12
91
78a

FIG. 2a

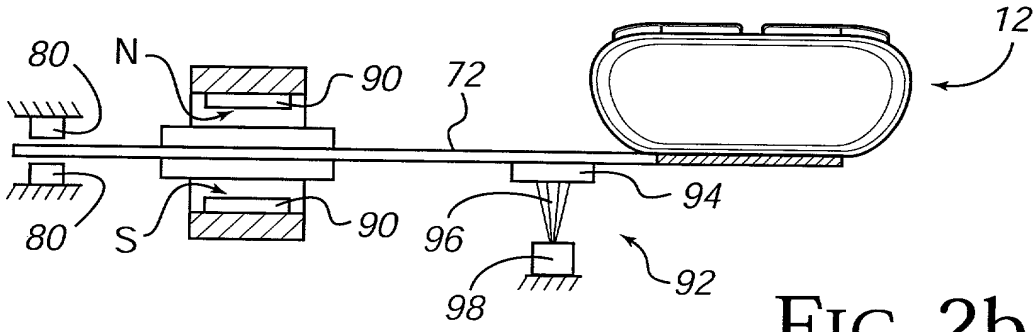

80
N
90
72
12
94
80
S
90
96
92
98

FIG. 2b

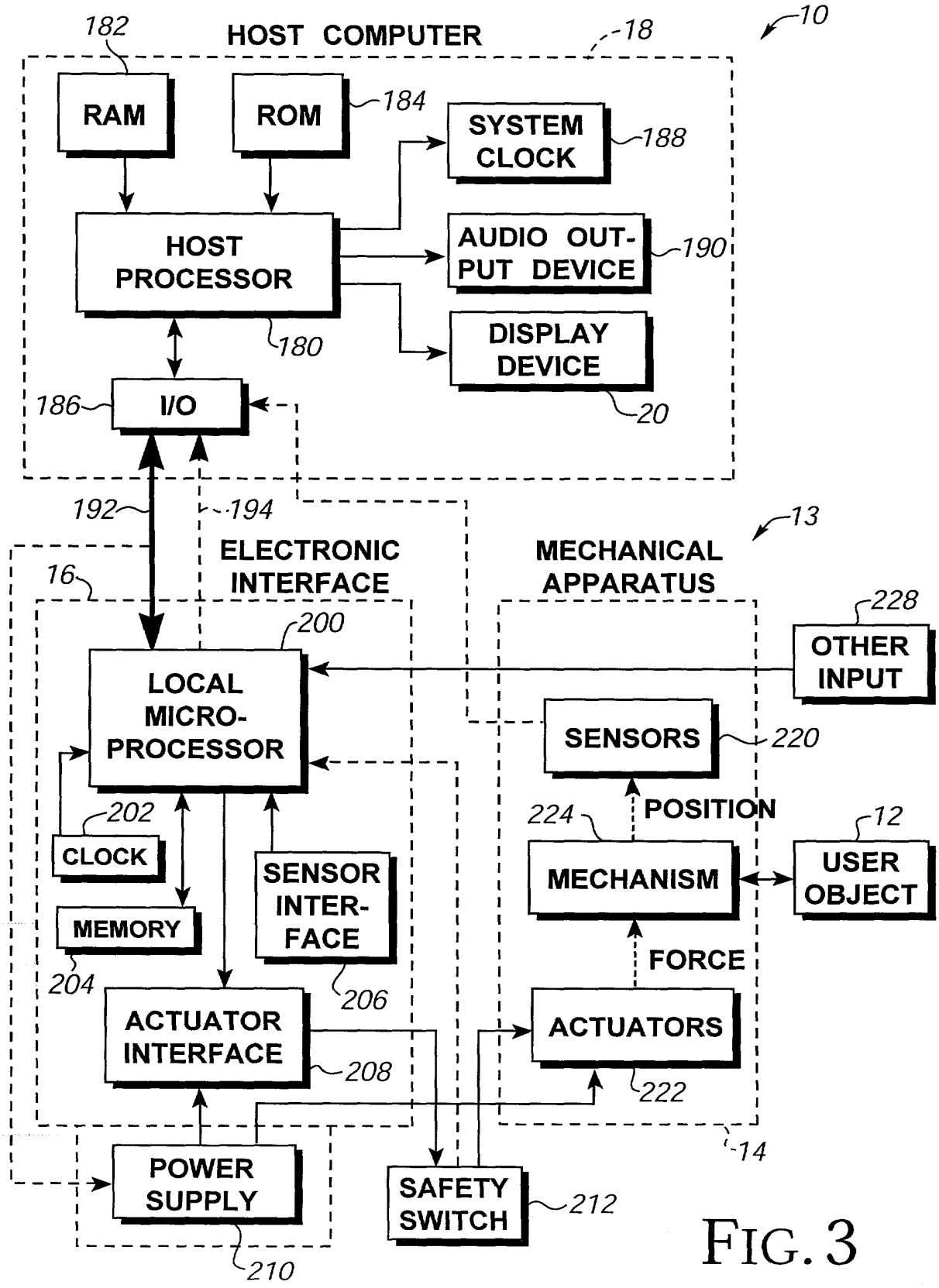

10
182
HOST COMPUTER
18
RAM
ROM
184
SYSTEM CLOCK
188
HOST PROCESSOR
AUDIO OUT-PUT DEVICE
190
180
DISPLAY DEVICE
20
186
I/O
192
194
13
ELECTRONIC INTERFACE
MECHANICAL APPARATUS
16
228
OTHER INPUT
200
LOCAL MICRO-PROCESSOR
SENSORS
220
POSITION
224
202
12
CLOCK
MECHANISM
USER OBJECT
SENSOR INTER-FACE
MEMORY
FORCE
204
206
ACTUATOR INTERFACE
208
ACTUATORS
222
14
POWER SUPPLY
SAFETY SWITCH
212
210

FIG. 3

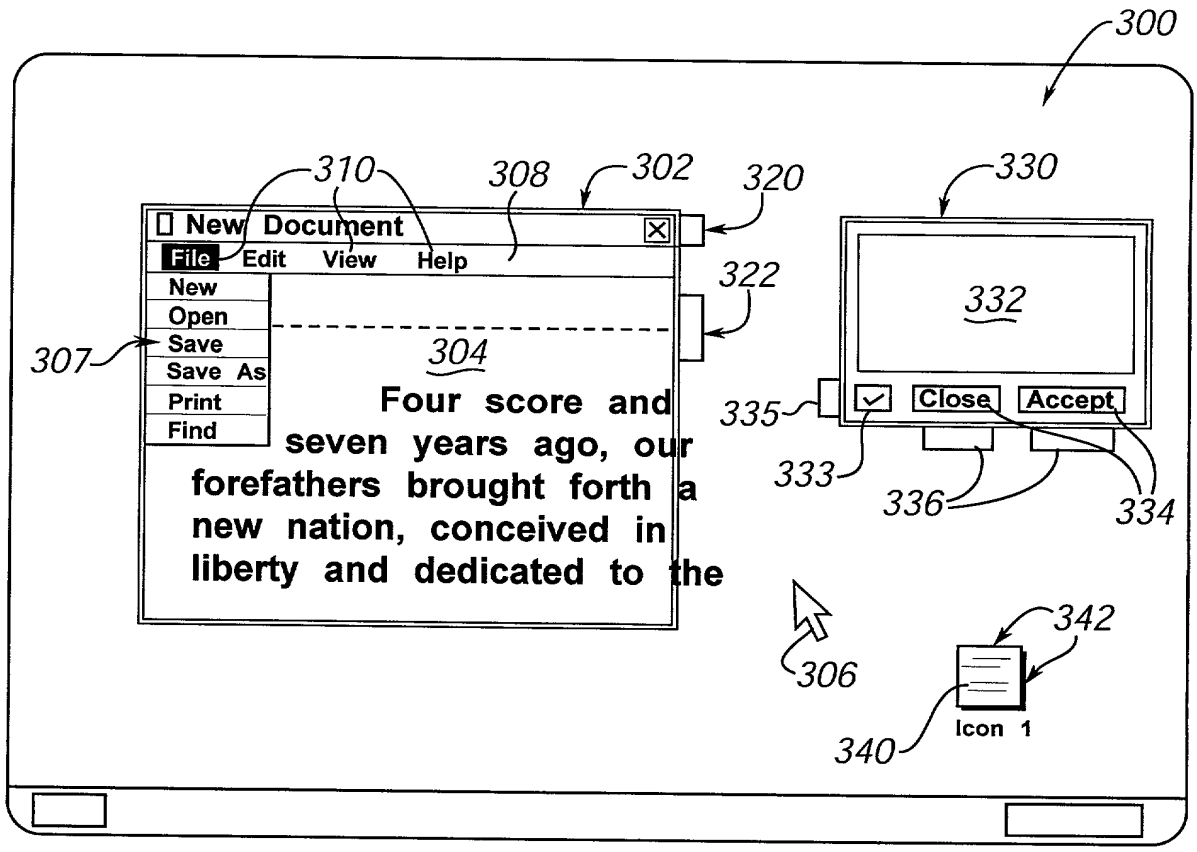


FIG. 4

FIG. 5a

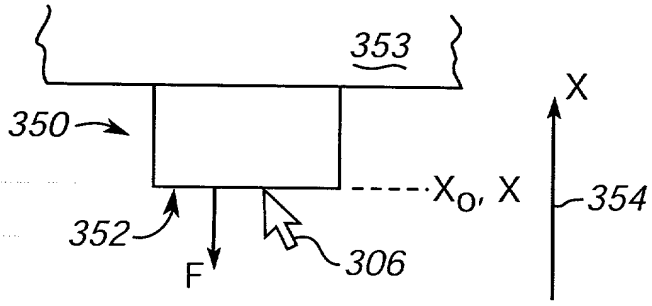


FIG. 5c

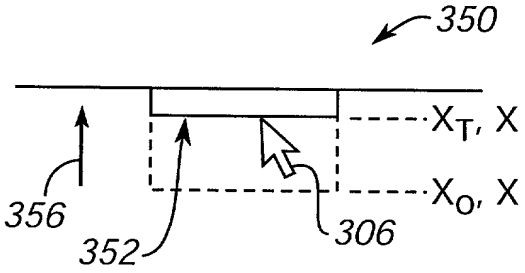


FIG. 5b

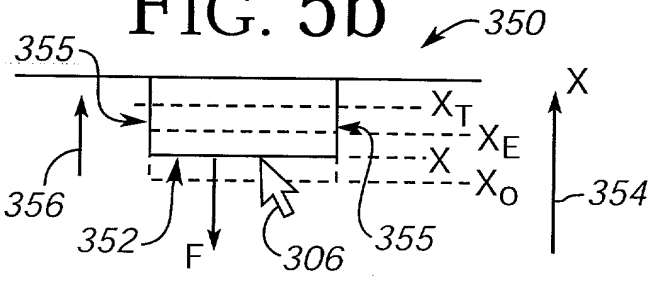


FIG. 5d

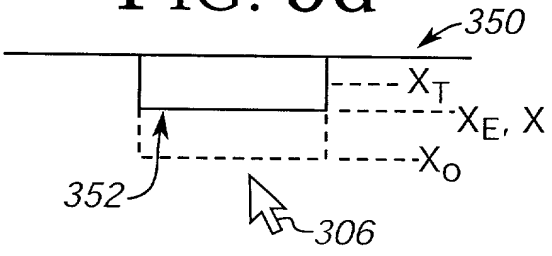


FIG. 5e

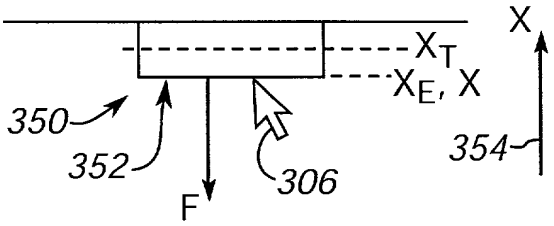


FIG. 5g

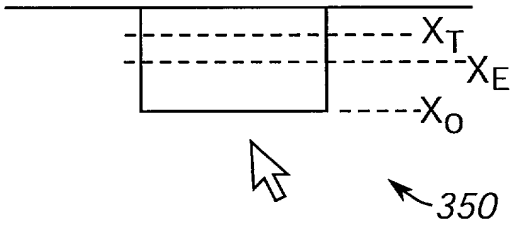


FIG. 5f

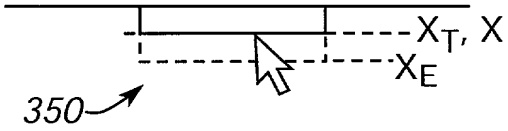


FIG. 6a

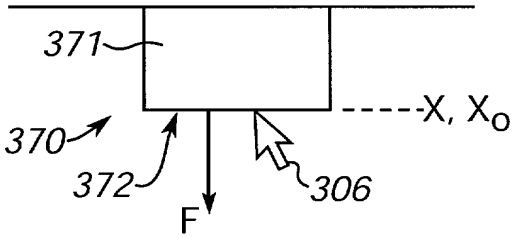


FIG. 6c

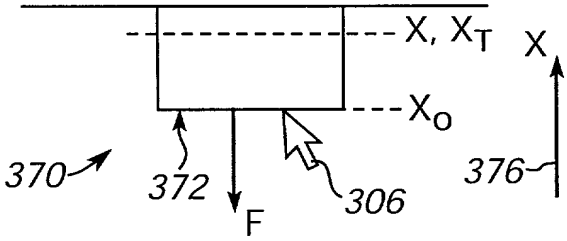


FIG. 6b

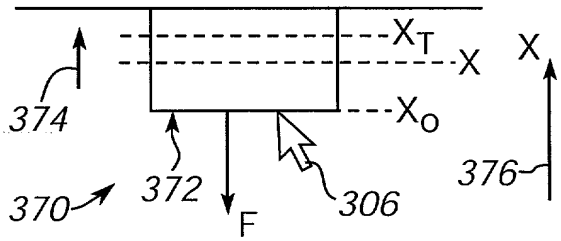


FIG. 6d

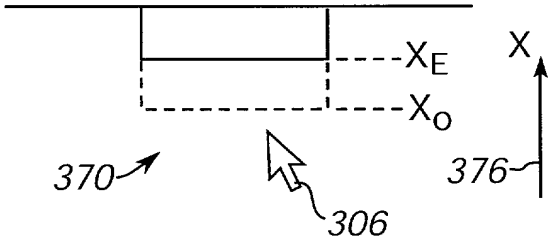


FIG. 6e

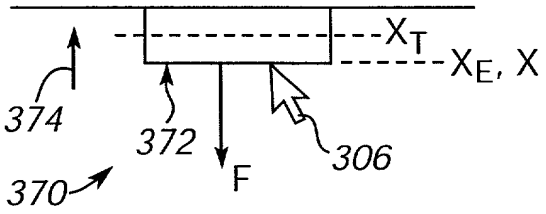


FIG. 6g

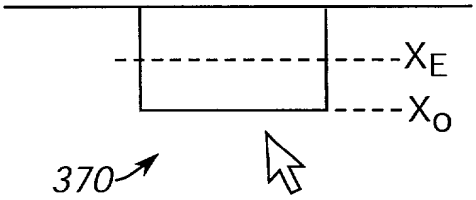


FIG. 6f

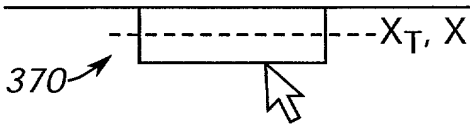


FIG. 7a

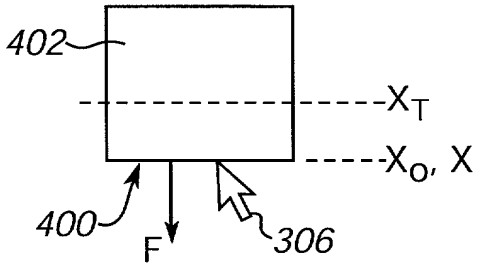


FIG. 7d

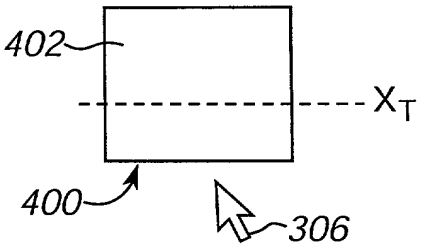


FIG. 7b

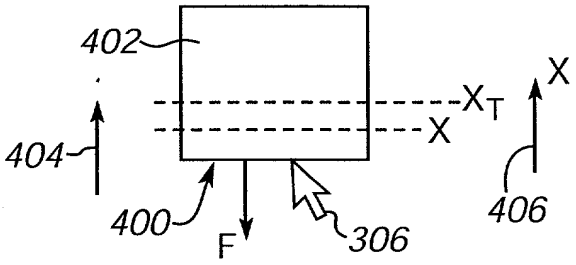


FIG. 8

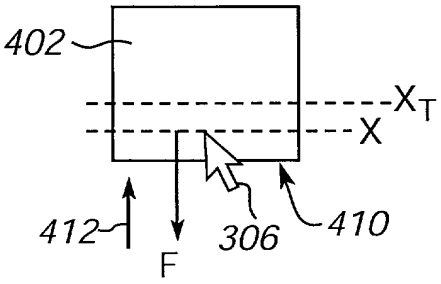
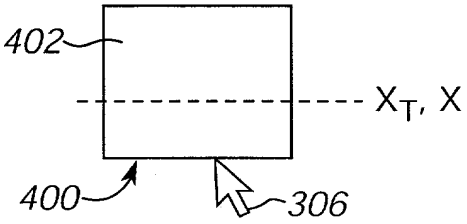


FIG. 7c



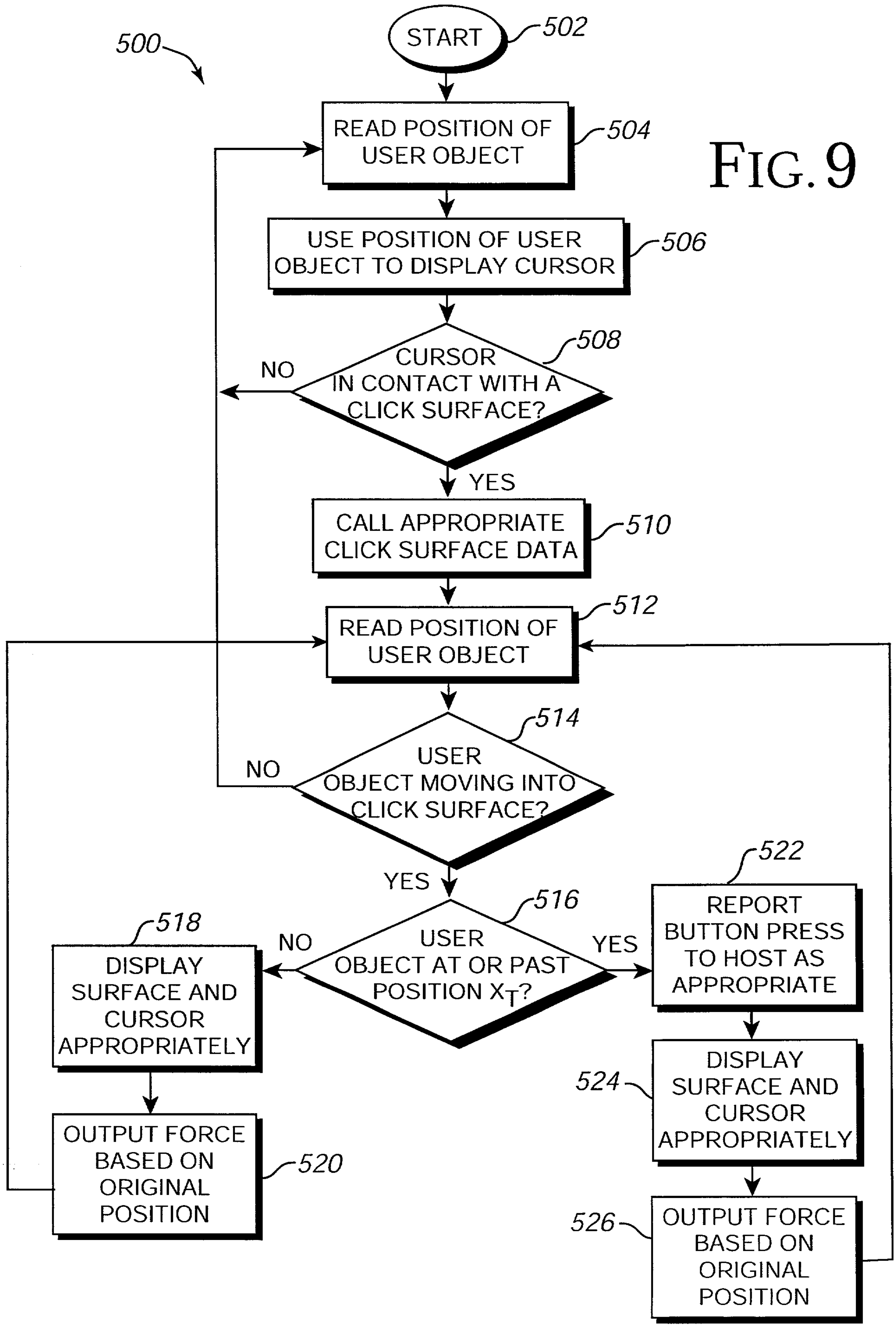

500
START
502
READ POSITION OF USER OBJECT
504
USE POSITION OF USER OBJECT TO DISPLAY CURSOR
506
CURSOR IN CONTACT WITH A CLICK SURFACE?
508
NO
YES
CALL APPROPRIATE CLICK SURFACE DATA
510
READ POSITION OF USER OBJECT
512
USER OBJECT MOVING INTO CLICK SURFACE?
514
NO
YES
USER OBJECT AT OR PAST POSITION X_T?
516
NO
YES
DISPLAY SURFACE AND CURSOR APPROPRIATELY
518
OUTPUT FORCE BASED ON ORIGINAL POSITION
520
REPORT BUTTON PRESS TO HOST AS APPROPRIATE
522
DISPLAY SURFACE AND CURSOR APPROPRIATELY
524
OUTPUT FORCE BASED ON ORIGINAL POSITION
526

FIG. 9